

Program for Optimal Raw Mix Design

1. MIXOPT.....	284
1.1 OPTIMAL RAW MIX DESIGN ON PERSONAL COMPUTER.....	284
2. PROGRAM FOR OPTIMAL RAW MIX DESIGN	284
2.1 FACILITIES	284

1. MIXOPT

1.1 OPTIMAL RAW MIX DESIGN ON PERSONAL COMPUTER

MIXOPT is a comprehensive program for the optimal design of raw mixes and determination of product characteristics. It is tailored to the specific needs of the cement industry and offers a wide range of applications in the field of raw meal preparation and product design:

- ◆ Up to 9 components may be included to determine a raw mix of desired characteristics.
- ◆ Fixed values or ranges may be set for chemical (e.g. Na₂O-equivalent) and mineralogical (e.g. C₃A) constraints of product characteristics.
- ◆ The component quantities can also be restricted. This might be necessary in case of limited availability or for fuel ash.
- ◆ Lowest cost product is determined within given product constraints if costs of components are entered
- ◆ Alternatively to cost optimisation, optimisation or minimisation of a particular chemical component is possible.
- ◆ Blending of materials or determination of raw meal, clinker and cement characteristics can be accomplished apart from raw mix optimisations.
- ◆ Program includes data base and print facilities.

Typical MIXOPT applications are illustrated on the following pages.

The knowledge required to operate the programs can quickly be acquired. Dialogue, window menu selection, and user's help facilities make it very user-friendly. Previous computer knowledge is not required.

The program or further information is provided by:

"Holderbank" Management and Consulting Ltd.,
Technical Centre Materials Division,
5113 Holderbank,
Switzerland

or

"Holderbank" Consulting Ltd.
2310 Lakeshore Road W.
Mississauga,
Ontario
Canada LSJ 1K2

2. PROGRAM FOR OPTIMAL RAW MIX DESIGN

2.1 FACILITIES

- ◆ BLENDING OF COMPONENTS
- ◆ DETERMINATION OF PRODUCT CHARACTERISTICS
 - Raw Max
 - Clinker
 - Cement

- ◆ **RAW MIX DESIGN WITH UP TO 9 COMPONENTS**
 - Fixed Value or Range for Product Constraints of:
 - Limitation of Component Concentrations
 - Input Specification such as:
 - Reference to Moist or Dry Components
- ◆ **COST OPTIMISATION OF PRODUCT**
- ◆ **DATA BASE FACILITIES FOR:**
 - Components
 - Product Constraints (e.g. for different clinker types)
 - Calculated Product
- ◆ **PRINT FACILITIES**
 - Single Mix Design
 - Compilation of Mixes
- ◆ **GENERAL USER FACILITIES**
 - Insertion and Copying Mode
 - Title Specification
 - File Clearing
 - Help

Fig. 1 Blending of Components.

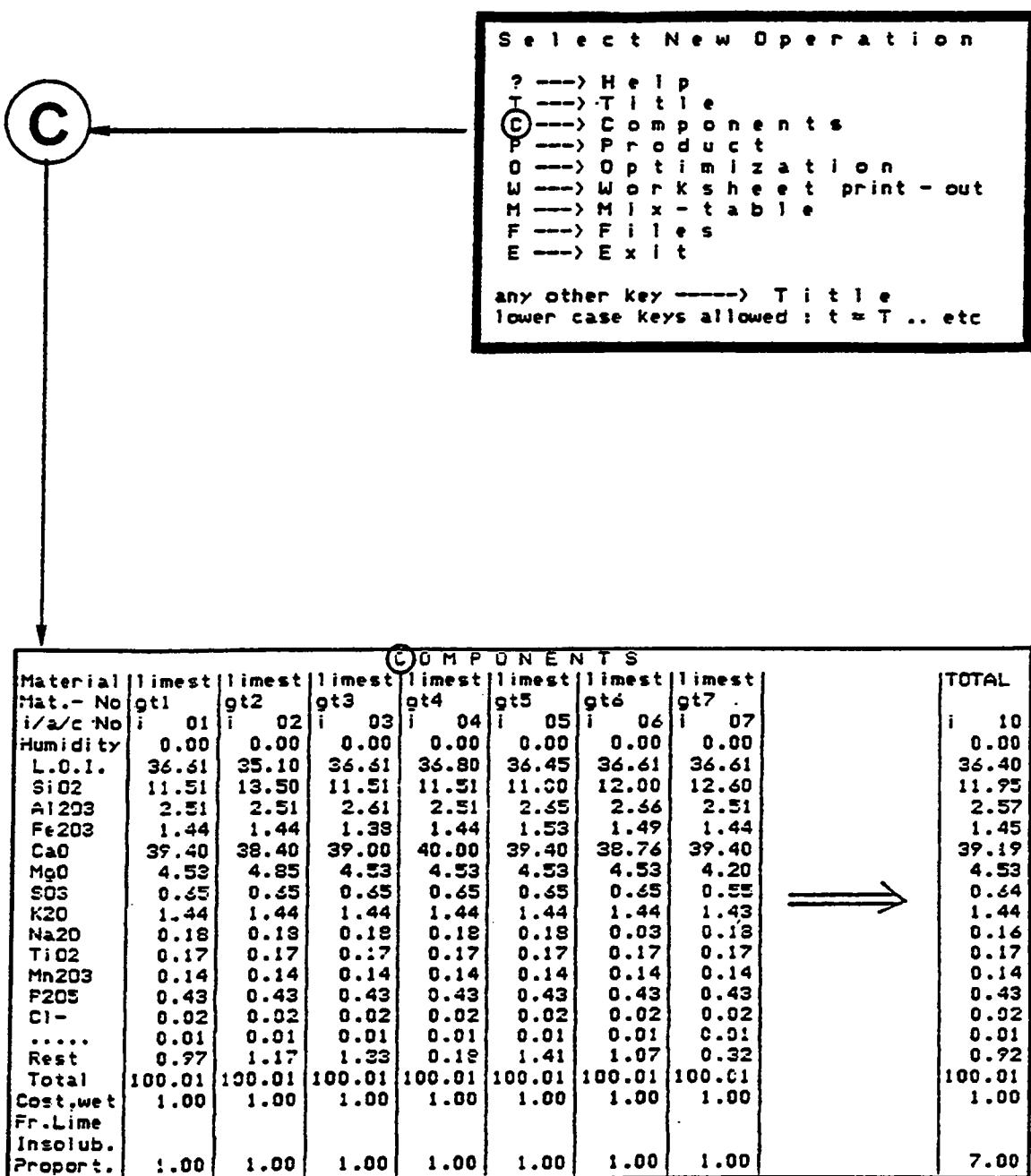


Fig. 2 Product Characteristics.

P →

Select New Operation					
? → Help	T → Title				
F → Components	P → Product				
D → Optimization	W → Worksheet print - out				
M → Mix-table	F → Files				
E → Exit					
any other key → Product lower case Keys allowed : t = T .. etc					

↓

P R O D U C T					
Constraints		Moduli/Bogue		Chem. Composition	
Minimum	Maximum	Raw-Mix	Clinker	Raw-Mix	Clinker
Lime Saturat.			95.02	L.O.I.	0.05
Silica Ratio			2.23	SiO2	21.77
Alumina Ratio			1.89	Al2O3	5.03
C3S			55.50	Fe2O3	2.67
C2S			20.58	CaO	45.21
C3A			8.83	MgO	1.00
C4AF			8.12	SO3	2.90
C4AF + 2C3A			25.78	K2O	0.59
SiO2				Na2O	0.14
Al2O3				TiO2	0.02
MgO				Mn2O3	0.03
Na2O-eq.				P2O5	0.02
No.1 type I K				C1-	0.01
				0.01
				Rest	0.56
				Total	100.00
				LPh-1338	18.00
				LPh-1400	22.45
				Alk/SO3	0.23
				Na2O-eq.	0.53
Product	Totals:		100.00	Cost	0.00

Fig. 3 Mix Optimisation.

P → **Select New Operation**

? ----> Help
T ----> Title
C ----> Components
P ----> Product
O ----> Optimization
W ----> Worksheet print - out
M ----> Mix-table
F ----> Files
E ----> Exit

any other key ----> Product
lower case keys allowed : t = T .. etc

P R O D U C T

Constraints	Moduli/Bogue	C h e m . C o m p o s i t i o n	Composition	
			Raw-Mix	Clinker
Lime Saturat.	95.02	L.O.I.	3.05	
Silica Ratio	2.83	SiO2	21.77	
Alumina Ratio	1.89	Al2O3	5.03	
C3S	55.50	Fe2O3	2.57	
C2S	20.58	CaO	65.21	
C3A	8.83	MgO	1.00	
C4AF	8.12	SO3	2.90	
C4AF + 2C3A	25.72	K2O	0.59	
SiO2		Na2O	0.14	
Al2O3		TiO2	0.02	
MgO		Mn2O3	0.03	
Na2O-eq.		P2O5	0.02	
No.1 tipoi	100.00	Cl-	0.01	
		0.01	
		Rest	0.56	
		Total	100.00	
		LPh-1339	18.00	
		LPh-1400	22.45	
		Alk/SO3	0.23	
		Na2O-eq.	0.53	
Product	Totals:	100.00	Cost	0.00

Fig. 4 Compilation of Results.

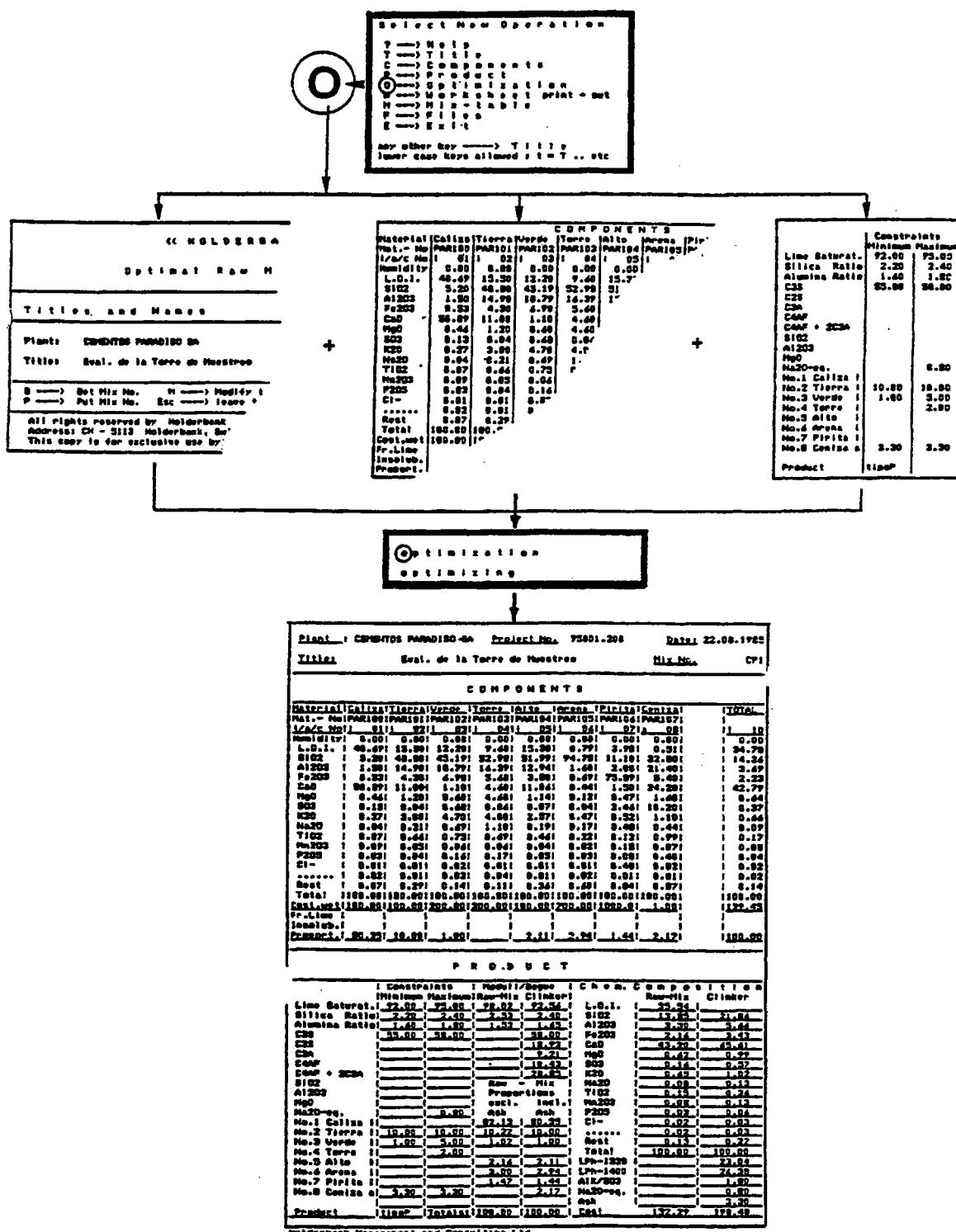


Fig. 5 Storage of Data, Constraints and Results.

